

REMARKS

Amendments

Claim 1 has been amended to recite that the visual enhancement additive is both dispersed and encapsulated within the amphipathic copolymer. This amendment clarifies that the visual enhancement additive is not a moiety that is bonded to the amphipathic copolymer, but rather a separate component that is encapsulated by the amphipathic copolymer. This amendment finds antecedent basis throughout the specification as filed, particularly at page 7, lines 20-22 and page 9, line 28 to page 10, line 3.

Claims 31 and 32 have been amended to fully recite steps taken in carrying out the image formation. These amendments find antecedent basis throughout the specification as filed, particularly at page 32, line 21 to page 33, line 4.

Claim Rejections Under 35 USC § 112

Claims 31 and 32 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 31 and 32 have been amended to fully recite steps taken in carrying out the image formation. It is respectfully submitted that this amendment overcomes the objection stated in the Office Action.

Claim Rejections Under 35 USC § 103

Claims 1-34 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kosel (US 3,753,760) in view of Handbook of Imaging Materials by Diamond and Weiss.

The present claims are drawn to liquid electrophotographic toner compositions comprising a liquid carrier having a Kauri-Butanol number less than about 30 mL and a plurality of toner particles dispersed in the liquid carrier. The toner particles comprise at least one visual enhancement additive dispersed and encapsulated within an amphipathic copolymer, wherein the amphipathic copolymer comprises one or more S portions and one or more D portions. As noted in the specification at page 7 beginning at line 19, a visual enhancement additive is considered to

be encapsulated if it is substantially uniformly distributed throughout the polymer matrix. Such uniform distribution indicates that the polymer substantially or completely surrounds the visual enhancement additive, as compared to visual enhancement additives that are associated with the polymer by a media milling (e.g. ball milling) or other dispersion or mixing process. This encapsulation can be accomplished by chemically growing the amphipathic copolymer with at least one dispersed visual enhancement additive being present in the reaction system. See page 8, lines 28-30.

Previous dispersion processes, such as media milling processes, tend to generate toners having visual enhancement additives having substantial portions of their surfaces exposed to both visual observation and adverse physical and electrical environments. Similarly, one would expect that alternative constructions where the visual enhancement additive is a moiety that is bonded to the amphipathic copolymer would also provide a configuration wherein the surface of the visual enhancement additives would have substantial portions of their surfaces exposed to both visual observation and adverse physical and electrical environments. The presently described encapsulation of such visual enhancement additives provides a distinct advantage in preventing undesired discharge of the toner during storage or use. This advantage is demonstrated in the Examples, wherein toner compositions of the present invention were shown to exhibit significantly longer Charging Retention Times than a comparative example made using the very same amphipathic copolymers, but with a conventional process that did not result in encapsulation.

Kosel discloses liquid toners using an amphipathic molecule. Kosel describes two different methods of incorporating a color agent in the toners. In the first method, “the amphipathic polymer combines in one complex molecule the fixing agent, which is one or more of the moieties, the dispersing agent, which is one or more of the moieties, and optionally, a color agent, which is one or more of the moieties.” See column 9, lines 33-39. In the other disclosed way of incorporating a color agent is by “using pigments or dyes added to the latex and physically dispersing them as by ball milling or high shear mixing.” See column 15, lines 41-43. It is respectfully submitted that neither approach would provide a visual enhancement additive that is dispersed and encapsulated within an amphipathic copolymer as required in the present claims.

As noted in the Office Action, Diamond and Weiss is cited for the purpose of describing particle size and general liquid toner preparation teachings. Diamond and Weiss fail to add

anything to the Kosel disclosure that would teach or suggest providing a visual enhancement additive that is dispersed and encapsulated within an amphipathic copolymer as required in the present claims. Additionally, the references alone or in combination would not have motivated the skilled artisan to provide a toner composition as presently claimed, or taught or suggested that an advantage in preventing undesired discharge of the toner during storage or use could be obtained through the configuration of the presently claimed toner composition.

It is respectfully submitted that the method of making the toner compositions, as specifically embodied in claim 20 and claims depending therefrom, are particularly patentable in view of the cited prior art. The references in no way teach or suggest making a liquid electrographic toner composition by dispersing a visual enhancement additive in a composition comprising S portion prepolymer and a solvent; and conducting a dispersion polymerization by reacting D portion materials with the S portion prepolymer to form an amphipathic copolymer, thereby encapsulating the visual enhancement additive within a layer of amphipathic copolymer to form encapsulated pigmented organosol particles.

Claims 1-34 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al. in view of Keoshkerian et al.

Qian (2002/0128349) teaches liquid inks comprising a stable organosol. The ink comprises a carrier liquid, a graft copolymer that comprises a steric stabilizer covalently bonded to a thermoplastic copolymer core, and a colorant. The organosol provides an improved electrophotographic ink composition with improved dispersion stability, chargeability and blocking resistance. See the Abstract. As discussed in paragraph 10, the organosol is converted to a toner by mixing the fully formed polymer with a colorant, and performing homogenization or milling processes to form a dispersion. Qian does not disclose a toner composition wherein a visual enhancement additive is dispersed and encapsulated within an amphipathic copolymer as required in the present claims.

Keoshkerian is cited to teach the reaction of a hydrophobic stabilizer and a pigment with a hydrophilic polymer. It is respectfully submitted that even in combination, these references do not teach or suggest a toner composition wherein a visual enhancement additive is dispersed and encapsulated within an amphipathic copolymer as required in the present claims. Additionally, the references even in combination do not teach or suggest the method of making the toner compositions, as specifically embodied in claim 20 and claims depending therefrom. The

method claims are particularly patentable over the cited references in the same manner as discussed above.

In view of the distinctions of the presently claimed subject matter over all of the cited art, when considered alone or in combination, it is respectfully submitted that the outstanding rejections have been overcome.

Conclusion

In view of the above remarks and amendments, it is respectfully submitted that the present application is now in condition for allowance. Early favorable consideration of the above application is earnestly solicited. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any issues in the application, the Examiner is invited to contact said attorney at (651) 275-9811.

Date: November 17, 2005

Respectfully Submitted,

By: 

Dale A. Bjorkman, Reg. No. 33,084

Customer No. 33072

Phone: 651-275-9811

Fax: 651-351-2954